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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,667	07/14/2003	Jun Sumino	67161-068	4737

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Washington, DC 20005-3096

EXAMINER
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PRENTY, MARK V

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 07/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/617,667	<b>Applicant(s)</b> SUMINO ET AL.	
	<b>Examiner</b> MARK V PRENTY	<b>Art Unit</b> 2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 7 and 8 is/are rejected.
- 7) ☒ Claim(s) 2-6 and 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>July 14, 2003</u> | 6) <input type="checkbox"/> Other: _____  |

This Office Action is in response to the papers filed on July 14, 2003.

Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Kanamori (United States Patent Application Publication 2002/0055217).

With respect to independent claim 1, Kanamori discloses a semiconductor device (see the entire reference, including the Fig. 4(b) disclosure, for example) comprising: a semiconductor substrate 1, having a main surface, in which first and second trenches 11 are formed in said main surface at a distance away from each other; first and second isolation insulating films 33 filling in said first and second trenches; a gate insulating film 2/30, formed on said main surface located between said first isolation insulating film and said second isolation insulating film, including silicon (oxide - note paragraphs [0057] and [0094]), having an end portion 30 in a birds beak form which brings into contact with said first isolation insulating film and said second isolation insulating film, respectively; and a silicon film 3 formed on said gate insulating film, having a thickness exceeding 0 and being less than 50 nm (i.e., "approximately 50 to 150 nm" – see paragraph [0054]) in an intermediate portion between said first isolation insulating film and said second isolation insulating film, and being thinner than said thickness on said end portion.

Claim 1 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Kanamori.

With respect to dependent claim 7, Kanamori's gate insulating film 2/30 has a first top surface, each of said first and second isolation insulating films 33 has a second top surface, and the distance from said main surface to said second top surface is greater than the distance from said main surface to said first top surface.

Claim 7 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Kanamori.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kanamori (United States Patent Application Publication 2002/0055217) together with Chen et al. (United States Patent 5,773,861 – hereafter Chen).

Claim 8 depends on independent claim 1, which was rejected above under 35 U.S.C. 102(b) as being anticipated by Kanamori. The above explanation of the rejection of independent claim 1 under 35 U.S.C. 102(b) as being anticipated by Kanamori is hereby incorporated by reference into this rejection of dependent claim 8 under 35 U.S.C. 103(a) as being unpatentable over Kanamori together with Chen.

The difference, therefore, between claim 8's semiconductor device and Kanamori's semiconductor device is claim 8's silicon film includes phosphorous.

Chen teaches that silicon floating gates are conventionally doped with arsenic or phosphorous to make them conductive (see column 5, lines 45-55, and column 6, lines 34-37).

It would have been obvious to one skilled in this art to dope Kanamori's silicon floating gate 3 with phosphorous, because Chen teaches that a silicon floating gate is conventionally doped with phosphorous to make it conductive.

Claim 8 is thus rejected under 35 U.S.C. 103(a) as being unpatentable over Kanamori together with Chen.


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Claims 2-6 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable over the prior art of record if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record does not disclose or suggest the allowable semiconductor device taken as a whole, including the silicon film.

Shimizu (United States Patent 6,476,438), Lee et al. (United States Patent 6,515,329) and Satoh et al. (United States Patent 6,646,303) are relevant to this application.

Registered practitioners can telephone the examiner at (571) 272-1843. Any voicemail message left for the examiner must include the name and registration number of the registered practitioner calling, and the Application/Control (Serial) Number. Technology Center 2800's general telephone number is (571) 272-2800.

  
**Mark V. Prenty**  
**Primary Examiner**